R E P O R T R E S U M E S

ED 011 252 SP 000 928

THE EFFECT OF TRAINING IN INTERACTION ANALYSIS ON THE VERBAL TEACHING BEHAVIOR OF PRESERVICE TEACHERS.

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PUB DATE FEB 66

EDRS PRICE MF-$0.09 HC-$1.44 36P.

DESCRIPTORS- *CLASSROOM TECHNIQUES, *EFFECTIVE TEACHING, FEEDBACK, HUMAN RELATIONS UNITS, *INTERACTION PROCESS ANALYSIS, SIMULATION, *STUDENT TEACHERS, TEACHER ATTITUDES, *TEACHER EDUCATION, TEACHER EVALUATION, *VERBAL COMMUNICATION, CHICAGO

AS THE CULMINATION OF A 2-YEAR COURSE REVISION AND EVALUATION PROJECT FOR THE INTRODUCTORY PROFESSIONAL COURSE FOR SECONDARY SCHOOL TEACHERS, FIVE EXPERIMENTAL COMBINATIONS OF METHODS FOR TEACHING HUMAN RELATIONS SKILLS AND THE ANALYSIS OF VERBAL CLASSROOM TEACHING BEHAVIOR WERE EMPLOYED. THE ESSENTIAL INDEPENDENT VARIABLE WAS THE USE VERSUS NONUSE OF INTERACTION ANALYSIS (EMPLOYING CATEGORIES SIMILAR TO THOSE IN FLANDERS' SYSTEM) TO DESCRIBE THE VERBAL BEHAVIOR OF STUDENTS AND TEACHERS. THOSE TAUGHT THIS METHOD WERE FOUND TO USE, IN SIMULATED TEACHING SITUATIONS, SIGNIFICANTLY MORE VERBAL BEHAVIOR ASSOCIATED WITH HIGHER STUDENT ACHIEVEMENT AND WITH MORE POSITIVE STUDENT ATTITUDES (I.E., ACCEPTING AND ENCOURAGING BEHAVIOR). THE AUTHORS IMPLIED THAT TRAINING IN INTERACTION ANALYSIS PROVIDES A MORE ADEQUATE "COGNITIVE ORGANIZER" FOR INTERPRETING CLASSROOM EVENTS AND SERVES FEEDBACK FUNCTIONS. THIS PAPER WAS READ AT THE ANNUAL MEETING OF THE AMERICAN EDUCATIONAL RESEARCH ASSOCIATION (CHICAGO, FEBRUARY 1966). (LC)

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SP000928

Paper read at the annual meeting of the American Educational Research Association, Chicago, Illinois, February, 1966.

This paper reports findings from a two year course revision and institutional research project designed to create a more effective general methods course in The Ohio State University's program for the preparation of secondary school teachers.(14) As currently envisioned, this introductory course (Education 535, Theory and Practice in Secondary Education) is designed as an introduction to the instructional role of the teacher in the secondary school classroom. The primary behavioral outcomes of this course lie in the areas of human relation skills and skill in the appropriate use of a representative variety of verbal teaching behaviors.

There are, of course, several assumptions that underlie the purposes of this general methods course (Education 535). It is assumed that, all other things being equal, teachers who are (a) more accepting, unconditional and less rejecting in their relationships with students and (b) who are aware of and able to use a variety of appropriate teaching behaviors will be able to facilitate more learning in their classrooms. If these assumptions are true, then teacher training programs should provide experiences by which prospective teachers can improve their human relations skills and become more aware of and flexible in the use of a variety of appropriate teaching behaviors that have been found to be related to positive student attitudes toward school and their teachers and increased student achievement.

The use of effective human relations skills and flexibility in the use of appropriate verbal behaviors do not constitute the entirity of effective teaching. It is asserted, however, that these two areas of competence are needed by most, if not all secondary school teachers, and thus are appropriate objectives for a general methods course.

Literature in the field gives some support to the assumptions underlying the purposes of this introductory course in Ohio State's program for the preparation

of secondary school teachers. Rogers[16] has stated that student learning is enhanced by teachers who are congruent, and are capable of expressing unconditional positive regard and empathy to their students.[17] Rogers has also postulated a personality continuum from closedness to experience (stasis) to openness to experience (process). He suggests the possibility that the ability of a person to enter into a helping relationship with other persons may be directly related to this stasis - process factor and the person's ability to show to others the conditions of empathy, congruence and unconditional positive regard. Teacher empathy, acceptance and rejection of students can be observed in the verbal behavior of teachers by means of observational systems such as The Flanders System of Interaction Analysis.

In a pilot study of the effectiveness of dyadic programmed human relations training, Hough[15] reported that ten hours of such instruction significantly increased pre-service teachers' ability to show to others the conditions of empathy, congruence and unconditional positive regard as measured by the Relationship Inventory. Such change was found to be related to the openness or closedness of the belief-disbelief system of significant others with whom the person interacted during human relations training. It should be pointed out that in this study, human relations skills were restricted to those used in a dyadic relationship and were measured by a rating scale. No attempt was made to measure the use of empathic, accepting or rejecting behavior in a teaching situation.

In a study of teacher effectiveness, Flanders[6] found that teachers' use of indirect verbal behavior such as acceptance and clarification of student ideas and feelings, and encouragement and praise were associated with more positive attitudes toward school and higher student achievement in junior high school social studies and mathematics classes. He also found that teacher criticism rejection and extended verbal directness were associated with less positive

attitudes and lower student achievement. Similar findings were reported by Amidon and Flanders (1) in a study in which eighth grade students were found to have learned more geometry when taught by an indirect teaching style than by a more direct teaching style.

In a study of the feasibility of changing verbal teaching behavior of in-service teachers, Flanders (3) found that teachers could become more indirect in their teaching style by experiencing a workshop in which interaction analysis was taught as a technique for analyzing their verbal teaching behavior.

In a study of the effect of teaching interaction analysis to student teachers Hough and Amidon (10) found that student teachers who were taught interaction analysis were seen by student teaching supervisors as being more effective in their student teaching than student teachers who had not been taught interaction analysis. In the same study Hough and Amidon found that supervisor ratings of student teachers were related to student teachers' scores on the Teaching Situation Reaction Test (a situational test designed to measure a teacher's human relations ability, openness to new experience and feelings of comfort in using a direct or indirect teaching style). In an extension of the work of Hough and Amidon, Furst (8) found that student teachers who were taught interaction analysis, used significantly more accepting verbal behavior and questions and significantly less criticism than student teachers not taught interaction analysis. Furst also found that those student teachers who were taught interaction analysis scored more positively on the Teaching Situation Reaction Test, a test that has been shown to be predictive of success in student teaching. (11)

In summary then, improved human relations skill and control of appropriate verbal teaching behavior constitute the basic behavioral objectives of The Ohio State University's introductory general methods course for the preparation of secondary school teachers. Literature in the field gives some support for the

purposes of this course and in addition suggests the feasibility of attaining the intended behavioral outcomes..

It was the purpose of this study to test the effect on verbal teaching behavior of (a) three methods of teaching human relations skills, and (b) two methods of teaching preservice teachers to analyze and control their verbal teaching behavior.

HYPOTHESIS

The hypothesis for this study proposed to test whether certain experimental treatments used in this study were more effective than others in facilitating the use of verbal teaching behaviors that have been found to be associated with increased student achievement and more positive attitudes toward school. Though the literature would suggest certain predictions, the hypothesis for this study was stated in the null-operational form as follows:

> Subjects experiencing the five experimental treatments used in this study will not differ in regard to the percentages of verbal behaviors they and their students use during a half-hour simulated lesson (as measured by observers using a thirteen category modification of the Flanders System of Interaction Analysis).

MEASURING INSTRUMENTS

Four instruments were used in this study. One was used to measure the dependent variable of verbal teaching behaviors used during simulated teaching. Three additional instruments were used to measure control variables that have been found in other research studies to be associated with growth in human relations skill and a person's use of selected verbal teaching behaviors.

Measurement of the Dependent Variable

Verbal teaching behaviors used by subjects during simulated teaching were measured by trained observers using a thirteen category modification of the Flanders System of Interaction Analysis. The development and validation of

interaction analysis as an observational technique is reported by Flanders in Teacher Influence, Pupil Attitudes and Achievement.(6) The modifications of the Flanders system that were used in this study include the following: (a) a sub-classification of Flanders category 9 to distinguish between student questions and declarative emitted responses, (b) a sub-classification of Flanders category 5 to distinguish between teacher initiated lecture and teacher lecture as an answer to student questions, (c) a sub-classification of Flanders category 7 to distinguish between corrective feedback and personalized criticism and sarcasm. These categories are taken from an observational system developed by Hough and reported in An Observational System for the Analysis of Classroom Instruction.(12) A summary of the category system used in this study may be found in Figure I.

FIGURE I

SUMMARY OF THE THIRTEEN CATEGORIES OF

VERBAL BEHAVIOR USED IN THIS STUDY*

Category Number		Description of Verbal Behavior
1	TEACHER	ACCEPTS FEELING: accepts and clarifies the feeling tone of students in a nonthreatening manner. Feelings may be positive or negative. Predicting and recalling feelings are also included.
2	TEACHER	PRAISES OR ENCOURAGES: praises or encourages student action or behavior. Jokes that release tension, not at the expense of another individual, nodding head or saying "uh-huh" or "go on" are included.
3	TALK	ACCEPTS OR USES IDEAS OF STUDENT: clarifying, building on, developing and accepting ideas of students.
4	TALK	ASKS QUESTIONS: asking a question about content or procedure with the intent that the student should answer.

Figure I Continued

5	TEACHER TALK	LECTURES: giving facts or opinions about content or procedure; expressing his own ideas; asking rhetorical questions.
6		ANSWERS STUDENT QUESTIONS: direct answers to question regarding content or procedure asked by students.
7		GIVES DIRECTIONS: directions, commands, or orders to which a student is expected to comply.
8		CRITICIZES OR JUSTIFIES AUTHORITY: statements intended to change student behavior from a nonacceptable to an acceptable pattern; bawling out someone; stating why the teacher is doing what he is doing so as to achieve or maintain control; rejecting or criticizing a student's opinion or judgment.
9		CORRECTIVE FEEDBACK: telling a student that his answer is wrong when the incorrectness of the answer can be established by other than opinion, i.e., empirical validation, definition or custom.
10	STUDENT TALK	STUDENT TALK-RESPONSE: talk by students in response to requests or narrow teacher questions. The teacher initiates the contact or solicits student's statement.
11		STUDENT TALK-EMITTED: talk by students in response to broad teacher questions which require judgment or opinion. Student declarative statements emitted but not called for by teacher questions.
12		STUDENT QUESTIONS: questions concerning content or procedure that are directed to the teacher.
13		SILENCE OR CONFUSION: pauses, short periods of silence, and periods of confusion in which communication cannot be understood by the observer.

$$\text{Indirect-Direct Ratio} : \frac{\text{categories } 1,2,3,4,6}{\text{categories } 5,7,8,9}$$

$$\text{Revised Indirect-Direct Ratio} : \frac{\text{categories } 1,2,3}{\text{categories } 7,8,9}$$

$$\text{Student-Teacher Ratio} : \frac{\text{categories } 1,2,3,4,5,6,7,8,9}{\text{categories } 10,11,12}$$

*The categories of verbal behavior used in this system are basically those used by Flanders in his ten category system of interaction analysis. Categories 6,9 and 12 represent additions to Flanders' category system.

Though Flanders and other users of interaction analysis report observer reliability in their studies, it is clear that data gathered by means of interaction analysis is only as valid as the reliability of the observers. The observation of classroom teaching behavior in this study was done by five observers who were trained in interaction analysis for several months. The inter-observer reliability of the five observers in this study was obtained prior to any gathering of data. The means used to establish inter-observer reliability involved categorization of three tape recorded classroom situations of ten, fifteen and twenty minutes respectively. Each of the tape recorded classroom episodes contained all of the thireen categories of the observational system used in this study. Interobserver reliability was computed by a formula suggested by Scott.[19] The coefficients of inter-observer reliability for the five observers are reported in Table I.

Measurement of Control Variables

The stasis - process factor is related to a person's openness to central dimensions of problems and one's positive feelings of worth. It is assumed that persons at the process end of the stasis-process continuum are more capable of entering into and profiting from human relations training. In this study the stasis-process factor was measured by The College Student Problems Q-Sort developed by Freeze. The procedures used to develop this instrument as well as a report of the instrument's validity and reliability may be found in A Study of Openness as a Factor in Change of Student Teachers.[7]

The relative openness or closedness of a person's belief-disbelief system is related to a person's ability to receive, evaluate and act on relevant information received from the outside on its own intrinsic merits, unencumbered by irrelevant factors in the situation arising from within the person or from the outside. In this study, the relative openness or closedness of the belief-disbelief system was measured Form E of The Dogmatism Scale developed by Rokeach. The procedures used in the development of this instrument are reported in The Open and Closed Mind.[18] A corrected split half reliability of .86 for The Dogmatism Scale is

reported by Hough[15] in a study that involved a population and testing procedures similar to the ones used in this study.

Teacher characteristics associated with success in teaching (human relations ability, openness to experiences and comfort in using an indirect teaching style) were measured by means of The Teaching Situation Reaction Test developed by Duncan, Hough, Frymier and Amidon. The procedures used to develop this test as well as a report of its validity and reliability may be found in Exploratory Studies of a Teaching Situation Reaction Test.[11] A test-retest reliability of .84 is reported by Hough and Duncan using a population similar to the population involved in this study

TABLE I

INTEROBSERVER RELIABILITY COEFFICIENTS
FOR FIVE OBSERVERS ON THREE TAPE
RECORDED CLASSROOM SITUATIONS

Observer	OBSERVER				
	1	2	3	4	5
Ten Minute Tape					
1	1.00	.81	.89	.85	.91
2		1.00	.75	.69	.80
3			1.00	.88	.92
4				1.00	.86
5					1.00
Fifteen Minute Tape					
1	1.00	.83	.86	.92	.78
2		1.00	.85	.86	.82
3			1.00	.92	.86
4				1.00	.84
5					1.00
Twenty Minute Tape					
1	1.00	.86	.83	.94	.85
2		1.00	.86	.87	.77
3			1.00	.84	.72
4				1.00	.79
5					1.00

DESIGN

This study employed five treatment groups of eighty-four subjects each. Each treatment group was made up of students from four Education 535 classes (Two each during the winter and two during the spring quarter) making a total ot twenty classes in all. Three classes were scheduled at each of the following hours: 8:00 a.m., 10:00 a.m., 12:00 m. amd 2:00 p.m. Students registered for Education 535 at a given hour were randomly assigned to one of the three classes meeting at that hour.

The time of the day that classes met and the influence of individual instructors represent two variables that were considered as significant to control. In order to do this, the five instructors were assigned to class sections so that no instructo taught more than one class associated with any one of the five treatment groups. In addition, treatment types were randomly assigned to classes meeting during the variou hours of the day. This purposeful assignment of treatment types to instructors and the time during the day that classes met for the two quarters is presented in Figure II.

Treatment Groups Defined

The five treatment groups used in this study differed only with respect to the means of instruction used to teach human relations skills and the analysis of verbal teaching behavior.

Human relations training - Three methods were used to teach human relations ski The first method involved the use of The Human Dvelopment Insitutute's General Relationship Improvement Program.(2) The Relationship Improvement Program is a type of dyadic programed instruction designed to be used by two people for ten hour-long instructional sessions. During these ten sessions pairs of subjects react to the program and interact with each other by means of structured discussions and role plays based on concepts presented in the program. The objectives of the program are increased awareness of self and others and skill in showing to others the conditions of unconditional positive regard, empathy and congruence.

FIGURE II

ILLUSTRATION OF DISTRIBUTION OF TREATMENTS

BY INSTRUCTOR, CLASS PERIOD AND QUARTER

INSTRUCTORS	Winter Quarter	Spring Quarter		
	Treatment 1	Treatment 3	Treatment 2	Treatment 5
A	12:00 m	2:00 p.m.	8:00 a.m.	10:00 a.m.
	Treatment 1	Treatment 2	Treatment 5	Treatment 4
B	8:00 a.m.	10:00 a.m.	12:00 m	2:00 p.m.
	Treatment 3	Treatment 5	Treatment 4	Treatment 1
C	12:00 m	2:00 p.m.	12:00 m	2:00 p.m.
	Treatment 5	Treatment 4	Treatment 3	Treatment 2
D	8:00 a.m.	10:00 a.m.	10:00 a.m.	2:00 p.m.
	Treatment 4	Treatment 2	Treatment 3	Treatment 1
E	8:00 a.m.	12:00 m	8:00 a.m.	10:00 a.m.

The Relationship Improvement Program was scheduled for use once each week, with the exception of the first and seventh weeks of the quarter. Two sessions were covered during the eighth and ninth weeks. In this way all ten sessions were used during the ten week quarter.

The second method used to teach human relations skill employed selected readings on the theory and classroom application of human relations concepts. These concepts were discussed in class by means of whole class and group discussions. The estimated time spent in reading about and discussing human relations concepts and their classroom application was ten hours.

The third method involved pairs of students reading and discussing ten educational case studies of classroom instructional problems.

The case studies were discussed by pairs of students during ten separate one hour sessions. These dyadic case study discussions were distributed throughout the quarter on the same schedule as the use of The Relationship Improvement Program.

The second and third methods involving reading about and discussion of human relations concepts and the dyadic case study discussions were used as controls for the first method, i.e., use of The Relationship Improvement Program, which by its very nature involves dyadic discussion of human relations concepts.

Analysis of verbal teaching behavior - Two methods were used to teach the analysis of verbal teaching behavior. The first of these methods employed the Flanders Systen of Interaction Analysis. Students were taught the category system to the point of minimum proficiency. Minimum proficiency required that students be able to: (a) tabulate a twelve minute tape recorded classroom situation containing illustration of all categories at a minimum reliability of .60 (b) plot a matrix with no more than 5 per cent error (c) compute and interpret the meaning of the indirect-direct ratio, the revised indirect-direct ratio and the student-teacher ratio and (d) read and interpret the meaning of cell loadings in major regions of the matrix. In addition to the skills of tabulation and matrix interpretation, students who were taught interaction analysis also were involved in a series of simulated micro-teaching experiences in which they attempted to replicate their instructional intentions as expressed in models of teaching patterns. During the two weeks of the course that are devoted to observation and participation in public schools, students were encouraged to take interaction analysis on the teachers they were observing and to analyze the teacher's verbal behavior. During their two weeks of observation and participatio in the public schools, many students did one or more class periods of exploratory teaching. While they were teaching, another student trained to do so took interaction analysis on their teaching.

The second method of learning to analyze verbal teaching behavior did not use interaction analysis. Students taught under this method listened to tape recordings of classroom incidents and discussed the verbal behavior used in these recorded lessons. During class and small group discussions, categories of verbal behavior similar to those used in the Flanders System of Interaction Analysis were identified and discussed. The students did not, however, create a formal category system for observational purposes nor, of course, did they engage in matrix plotting or interpretation. In addition to listening to examples of classroom teaching situations and analyzing the verbal behavior used in these recorded lessons, students practiced patterns of teaching in a series of simulated micro-teaching situations. During the two weeks of observation in public schools, students observed teachers and analyzed their teaching by applying knowledge learned about teaching behavior in their college class. They also engaged in one or more periods of exploratory teaching.

The time spent in analysis of teaching behavior under the two methods (including eight hours of observation in the public schools and the time spent in micro-teaching) amounted to approximately twenty-five hours under each method.

With the exception of the experimental differences mentioned above, all other experiences were equivalent in all classes. These experiences involved such activitie as class discussions, lectures and skill sessions on selected instructional principles lectures and discussions on concepts of measurement, lectures and skill sessions in the stating of behavioral objectives, lectures and discussions on lesson planning, simulated teaching experiences and routine administrative matters and course evaluation procedures not connected with the study.

The treatment groups used in this study involved five combinations of methods of teaching human relations skills and the analysis of verbal teaching behavior. The experimental characteristics of each of the five treatments is summarized in Figure III.

FIGURE III

SUMMARY OF THE FIVE TREATMENTS

Treatment	Human Relations Training	Verbal Teaching Behavior Training
One	Readings, lectures and classroom discussion of human relations in teaching	Skill training in interaction analysis as a means of analyzing verbal teaching behavior
Two	Dyadic programed instruction in human relations skill	Analysis and discussion of verbal teaching behavior but no instruction in the skill of interaction analysis
Three	Readings, lectures and classroom discussion of human relations in teaching	Analysis and discussion of verbal teaching behavior but no instruction in the skill of interaction analysis
Four	Dyadic discussion of educational case studies	Analysis and discussion of verbal teaching behavior but no instruction in the skill of interaction analysis
Five	Dyadic programed instruction in human relations skill	Skill training in interaction analysis as a means of analyzing verbal teaching behavior

TESTING PROCEDURES AND DATA ANALYSIS

During the first week of the winter and spring quarters, all students in Education 535 classes were tested on The Dogmatism Scale, The Teaching Situation Reaction Test and The College Student Problems Q-Sort. Data presented in Table II shows that the five treatment groups did not differ significantly on pretest scores on the three control variables.

During the eighth and ninth weeks of the quarter, each student planned, taught and evaluated a half-hour simulated lesson in which members of his education class role played typical secondary school students. Students in all treatment groups were restricted to lessons in which at least 20 per cent of all verbal interaction must be student talk and in which no more than 40 per cent of any one classification or type of teacher talk was permitted. A special attempt was made in non-interaction analysis classes to translate this requirement into language that these students would understand.

TABLE II

ANALYSIS OF VARIANCE FOR THE FIVE TREATMENT GROUPS ON CONTROL VARIABLES

Source of Variance	Sum of Squares	d.f.	Mean Squares	F*
		Dogmatism Scale		
Between	663.60	4	165.90	.39
Within	176,964.48	415	426.42	
Total	177,528.08			
		College Student Problems Q-Sort		
Between	427.56	4	106.89	.77
Within	61,808.04	415	148.93	
Total	62,235.60			
		Teaching Situation Reaction Test		
Between	208.32	4	52.08	.47
Within	45,602.76	415	109.88	
Total	45,811.08			

*F ratio of 2.39 is significant at the .05 level with 4 and 415 d.f.

During the lesson, the student's instructor, a trained observer in interaction analysis, took interaction analysis on the student's lesson.

All students on whom complete data was not available were eliminated from the study. In order to equalize the size of treatment groups to facilitate statistical analysis, subjects were randomly eliminated from the four largest treatment groups to equalize group size at 84 subjects each.

Interaction analysis data for each student was plotted and the appropriate column totals and ratios were computed by means of a specially prepared computer matrix plotting program, using an I.B.M. 7094 computer. All other test data was hand scored and then treated by means of The Ohio State MR-90 computer program.

FINDINGS

Data presented in Table III shows the results of an analysis of variance for the precentages of verbal behavior used by subjects in the five treatment groups during a half-hour teaching simulation in which students in Education 535 classes played the roles of typical secondary school students. Significant F-ratios were obtained in nine of the thirteen analyses. This data shows clearly that treatment groups differed with respect to their use of the following teacher verbal behaviors: (a) praise and encouragement, (b) acceptance and clarification of student ideas (c) questions, (d) answers to student questions, (e) directions and commands, (f) criticism. The percentage of types of student talk used during simulated teaching was also found to differ between treatment groups. Significant F-ratios were obtained in the analyses of all three student talk categories.

TABLE III

ANALYSIS OF VARIANCE FOR FIVE TREATMENT GROUPS ON PERCENTAGE OF CATEGORIES OF VERBAL TEACHING BEHAVIOR USED DURING STIMULATED TEACHING

Source of Variance	Sum of Squares	d.f.	Mean Squares	F	p
		Category #1			
Between	.134	4	.033	.50	—
Within	27.470	415	.066		
Total	27.604				
		Category #2			
Between	124.32	4	31.08	4.90	.01
Within	2633.40	415	6.34		
Total	2757.72				
		Category #3			
Between	416.64	4	104.16	3.68	.01
Within	11,728.92	415	28.26		
Total	12,145.56				
		Category #4			
Between	336.84	4	84.21	3.45	.01
Within	10,132.92	415	24.42		
Total	10,469.76				
		Category #5			
Between	790.44	4	197.61	1.24	—
Within	66,342.36	415	159.86		
Total	67,112.70				
		Category #6			
Between	316.68	4	79.17	2.52	.05
Within	13,033.44	415	31.40		
Total	13,350.12				

Table III continued

Source of Variance	Sum of Squares	d.f.	Mean Squares	F	p
		Category #7			
Between	140.28	4	35.07	2.39	<.05
Within	6,124.44	415	14.75		
Total	6,264.72				
		Category #8			
Between	2.42	4	.605	4.14	<.01
Within	60.48	415	.146		
Total	62.90				
		Category #9			
Between	1.94	4	.485	1.17	___
Within	171.36	415	.413		
Total	173.30				
		Category #10			
Between	1,635.48	4	408.87	6.86	<.01
Within	24,709.44	415	59.54		
Total	26,344.92				
		Category #11			
Between	1,799.28	4	449.82	3.72	<.01
Within	50,152.20	415	120.85		
Total	51,951.48				
		Category #12			
Between	90.72	4	24.30	2.97	<.05
Within	3,401.16	415	8.19		
Total	3,491.87				

Table III Continued

Source of Variance	Sum of Squares	d.f.	Mean Squares	F	P
		Category #13			
Between	299.88	4	74.97	2.32	___
Within	13,431.60	415	32.36		
Total	13,731.48				

There is some question regarding the appropriateness of further tests following a one way analysis of variance. Guilford,(9) however, suggests a modified t test following an F test that is designed to ascertain which group means differ significantly from the population mean when a significant F-ratio is obtained. Table IV presents a summary of these tests. Data presented in this table indicates that students in treatment one (the treatment which combined the teaching of interaction analysis with readings and discussion of human relations concepts) used significantly more praise and encouragement and questions and significantly less criticism during their simulated teaching than the total population from which they were drawn. Students in treatment five (the treatment which combined human relations training by means of The Relationship Improvement Program with instruction in interaction analysis) used significantly more accepting and clarifying behavior during their simulated teaching and generated significantly more student initiated responses and significantly fewer teacher initiated responses.

Subjects in treatment two (in which the use of The Relationship Improvement Program was combined with the teaching of the analysis of verbal behavior without the aid of a formal category system) used significantly more directions and elicited significantly more teacher initiated student responses.

TABLE IV

TREATMENTS THAT DIFFER SIGNIFICANTLY FROM
THE POPULATION ON CATEGORIES OF VERBAL BEHAVIOR
ON WHICH SIGNIFICANT F-RATIOS WERE OBTAINED
(N=84 in each treatment)

Category of Verbal Behavior	M_t	Interaction Analysis Treatments 1 and 5			Non-Interaction Analysis Treatments 2,3, and 4		
		Treatment	M	d_s	Treatment	M	d_s
Category #1	.09	- - - - - - - - - - - -			- - - - - - - - - - - -		
Category #2	3.12	#1	3.98	+.86**	#3	2.28	- .84**
Category #3	9.81	#5	11.37	+1.56**	#3	8.33	-1.48*
Category #4	11.11	#1	12.86	+ 1.75**	#4	12.18	+ 1.07*
Category #5	31.57	- - - - - - - - - - - -			- - - - - - - - - - - -		
Category #6	7.15	- - - - - - - - - - - -			#2	7.87	-1.20*
					#3	8.43	+ 1.28*
Category #7	2.36	- - - - - - - - - - - -			#2	3.24	+ .88*
Category #8	.17	#1	.08	- .09*	#3	.28	+.11*
Category #9	.50	- - - - - - - - - - - -			- - - - - - - - - - - -		
Category #10	11.93	#5	9.25	-2.68**	#2	14.43	+ 2.50*
					#4	9.98	-1.95*
Category #11	10.28	#5	12.65	+2.37*	#3	6.77	-3.51*
Category #12	3.89	- - - - - - - - - - - -			#3	4.59	+ .70*
Category #13	7.69	- - - - - - - - - - - -			- - - - - - - - - - - -		

Significant deviations from the population mean are computed by multiplying $\sqrt{MS_w/n}$ times the t ratio for a given level of significance and degrees of freedom.

**Significant .01 with 419 d.f.
*Significant .05 with 419 d.f.

Subjects in treatment four (in which dyadic case study discussions were used in conjunction with a non-interaction analysis investigation of teacher verbal behavior) used significantly more questions yet generated significantly fewer teacher initiated student responses. Subjects in treatment three (the treatment groups in which human relations content was taught by means of readings and class discussions and in which the analysis of verbal teaching behavior was taught without the aid of a formal category system) used significantly less praise and encouragement and acceptance and clarification and significantly more directions and corrective feedback. In addition, subjects in this treatment group generated fewer student initiated responses but had significantly more questions asked by students and more teacher answers to student questions.

In summary, data presented in Table IV shows a trend toward greater use of categories of indirect influence during simulated teaching by subjects in treatments taught interaction analysis. A similar trend toward the use of more direct influence by subjects in treatment groups in which the analysis of verbal behavior was taught without the aid of a formal category system is also apparent. This is particularly true of treatments two and three.

Data presented in Table IV shows this trend even more clearly. In this table I presented the results of a series of *t* tests comparing the verbal behaviors used in combined treatment groups in which interaction analysis was taught with combined treatment groups in which instruction in the analysis of verbal teaching behavior did not make use of a formal category system.

Table VI shows the results of a series of *t* tests comparing the categories of verbal behavior used by subjects in treatment groups taught human relations skills b which the program was not used. Only in the use of category three (acceptance and clarification of student ideas) did these two combined groups of subjects differ.

TABLE V

COMPARISON OF COMBINED INTERACTION ANALYSIS TREATMENT AND COMBINED NON-INTERACTION ANALYSIS TREATMENTS ON PERCENTAGES OF VERBAL BEHAVIORS USED DURING SIMULATED TEACHING

Category of Verbal Behavior	Interaction Analysis Treatments (N.168)		Non-interaction Analysis Treatments (N=252)			
	M	S.D.	M	S.D.	t	p
Category #1	.09	.20	.06	.28	1.32	___
Category #2	3.62	2.85	2.79	2.27	3.46	.01
Category #3	10.40	5.57	9.41	5.08	2.02	.05
Category #4	11.58	4.63	11.47	5.16	.23	___
Category #5	31.92	12.40	31.33	12.71	.49	___
Category #6	6.87	5.31	7.28	5.82	.79	___
Category #7	1.89	3.09	2.68	4.24	2.19	.05
Category #8	.12	.27	.21	.44	2.47	.05
Category #9	.43	.55	.55	.68	2.00	.05
Category #10	11.10	7.23	12.48	8.25	2.46	.05
Category #11	11.34	12.59	9.56	9.89	1.69	___
Category #12	3.58	2.52	4.09	3.06	1.88	___
Category #13	7.02	4.53	8.06	6.31	1.92	___

TABLE VI

COMPARISON OF COMBINED GROUPS USING THE HDI RELATIONSHIP IMPROVEMENT PROGRAM AND COMBINED GROUPS NOT USING THE PROGRAM ON THE PERCENTAGES OF VERBAL BEHAVIOR USED DURING SIMULATED TEACHING

Category of Verbal Behavior	HDI Program Treatments (N-168)		Non-HDI Program Treatments (N-252)			
	M	S.D.	M	S.D.	t	p
Category #1	.08	.36	.06	.15	.83	___
Category #2	3.11	2.43	3.13	2.64	1.09	___
Category #3	10.80	5.73	9.15	4.89	3.30	.01
Category #4	11.15	5.05	11.77	4.89	1.32	___
Category #5	31.62	12.28	31.53	12.81	.07	___
Category #6	6.24	4.85	7.70	6.02	.41	___
Category #7	2.49	4.53	2.27	3.31	.61	___
Category #8	.14	.31	.20	.42	1.66	___
Category #9	.50	.67	.51	.62	.01	___
Category #10	11.84	8.55	11.99	7.42	.20	___
Category #11	11.25	11.93	9.63	10.43	1.80	___
Category #12	3.54	2.60	4.12	3.02	.67	___
Category #13	7.19	5.69	7.94	5.68	1.39	___

SUMMARY AND DISCUSSION

The research reported in this paper was the culmination of a two year course revision and evaluation project dealing with the introductory professional course in The Ohio State University's program for the preparation of secondary school teachers. Five experimental treatments were used. These five treatments involved various combinations of methods for teaching human relations skill and the analysis of verbal classroom teaching behavior. The methods of instruction used in each of the treatment groups were piloted in classes prior to their use in the study. The five experimental treatments were developed as a result of experiences gained in trying out new teaching techniques in Education 535 classes. Each of the five treatment groups had the same behavioral objectives, i.e., the use, under simulated classroom conditions, of verbal behaviors that have been found to be associated with more positive student attitudes toward school and greater student achievement, i.e., accepting, clarifying and encouraging behavior rather than direc[illegible]e, critical and rejecting behavior.

Data presented in the findings section of this report indicate clear differences with respect to the types of verbal behavior used by students in the different group during their simulated teaching. Subjects in the treatment groups taught interactio analysis were found to use, in their teaching simulations, significantly more verbal behaviors that have been found to be associated with higher student achievement and more positive student attitudes toward their teachers and school. These same subjects were found to use significantly fewer behaviors that have been found to be associated with lower achievement and less positive attitudes.

That the verbal behavior of students who were taught interaction analysis diffe from those not taught this skill is clear. Why they differed presents a different question. One way of viewing these differences relates to an assumption underlying a rationale for teaching interaction analysis to teachers and prospective teachers.

It may be assumed that when the skill of interaction analysis is learned that it gives the teacher a feedback mechanism in the form of a category system, that he may use to become more sensitively aware of his own teaching behavior. (4) (5) (13) Interaction analysis seems to provide the teacher with a cognitive organizer to more accurately interpret the effects of his behavior on his students. In this way the teacher becomes more aware of his behavior. If interaction analysis, in fact, functions as a feedback mechanism, then it has the potential to act as a mechanism for the reinforcement of behavior. If this is true, then as students in Education 535 analyzed and experimented with their verbal teaching behavior and analyzed the behavior of other teachers, those students who had been taught interaction analysis had a more adequate cognitive organizer to aid them in interpreting and internalizing what they saw happening to themselves and to other teachers.

In all treatments, students were given a rationale for using acceptance, encouragement and praise and avoiding or judiciously using criticism, and directive behaviors that tend to restrict student freedom. In addition, students in all treatment groups were restricted during their simulated teaching (by the objectives of the course) to lessons in which at least 20 per cent of all verbal interaction must be student talk and in which no more than 40 per cent of any one classification or type of teacher talk was permitted. It is assumed that as students experimented with their teaching behavior, those who were taught interaction analysis had a more exacting way of perceiving and conceptualizing those behaviors which have been associated with more positive student achievement and attitudes. As students in Education 535 tried to use these behaviors in mirco-teaching and in exploratory teaching in the public schools, those who had been taught interaction analysis had a more adequate feedback mechanism to receive and interpret the effects of their behavior and the behavior they observed. In this way these behaviors were reinforced and thus became more likely to occur, e.g., in the simulated teaching situati

The significantly greater use of category three (acceptance and clarification of student ideas) by subjects in treatment five presents a most provocative finding. It was this treatment group that combined instruction in interaction analysis with human relations training by means of The HDI Relationship Improvement Program. An inspection of the summary matrixes for treatment groups in the appendix of this report shows that in addition to a greater total percentage of category three, subjects in treatment five used almost two thirds more extended acceptance and clarification (the 3-3 cell) than subjects in treatment four (The treatment group that rated second highest in its use of extended acceptance and clarification).

CONCLUSIONS AND IMPLICATIONS

The primary purpose of institutional research is to provide the basis for program evaluation and modification. This purpose was achieved by this study. On the basis of findings, and the two years of experience that led to the creation of this study; substantial modifications have been made in the introductory general methods course for the preparation of secondary school teachers at The Ohio State University. Interaction analysis is now taught to all students as a technique for analyzing their own verbal behavior. It should be pointed out that the emphasis is on analysis and not upon evaluation or judgment. We realize that we are a long way from identifying and shaping the behavior of effective teachers let alone identifying prospective good teachers from data gathered on the basis of one or even a few simulated teaching experiences. Indeed, we have not even seriously addressed ourselves to the problem of predicting teacher effectiveness on the basis of performance in preservice education classes.

Data reported with respect to the effect of the interaction of the three human relations training designs and the two training designs for the analysis of verbal teaching behavior seems to indicate that the combinations of experimental variables produced interactions that should be investigated in future studies. Certainly, the combination of classroom applications of non-directive theory and social-emotion

theory of classroom interaction present a provocative area of study in educational methodology that needs more rigorous investigation. To draw more than such a recommendation from this data could be presumptious.

Because of the time lag between when students take Education 535 and the time that they do their student teaching, it may be assumed that students will forget much of what they learned about controlling their verbal behavior. We are, therefore, following a selected population of these students into their student teaching. Our intention here is to see if the differences that we found in teacher verbal behavior under simulated conditions will continue to be manifested in student teaching six to twelve months later. In this study, the verbal behavior during student teaching of subjects who were taught interaction analysis is being compared with subjects who were not instructed in this technique for the analysis of verbal teaching behavior.

REFERENCES

1. Amidon, E.J. and Flanders, N.A. "The Effects of Direct and Indirect Teacher Influence on Dependent Prone Students Learning Geometry," Journal of Educational Psychology, 52 (1961) 286-291.

2. Berlin, Jerome I and Wyckoff, Benjamin, "The Teaching of Improved Interpersonal Relations Through Programed Instruction for Two People Working Together", paper read at the annual meeting of The American Psychological Association, 1963.

3. Flanders, Ned A., Helping Teachers Change Their Behavior. Ann Arbor: School of Education, University of Michigan, 1963.

4. Flanders, Ned A. "Intent, Action and Feedback: A Preparation for Teaching," Journal of Teacher Education, XIV (1963) 251-260.

5. Flanders, Ned A. "Interaction Analysis: A Technique for Quantifying Teacher Influence," Paper read at the annual meeting of The American Educational Research Asociation, Chicago, Illinois, February, 1961.

6. Flanders, Ned A. Teacher Influence, Pupil Attitudes and Achievement. Washington: U.S. Department of Health, Education and Welfare (OE-25040 Cooperative Research Monograph No. 12) 1965.

7. Freeze, C.R. "A Study of Openness as a Factor in Change of Student Teachers." Unpublished Doctoral Dissertation, University of Alabama, 1963.

8. Furst, Norma, "The Effects of Training in Interaction Analysis on The Behavior of Student Teachers in Secondary Schools," Paper read at the annual meeting of The American Educational Research Association, Chicago, Illinois, February, 1965.

9. Guilford, J.P. Fundamental Statistics in Psychology and Education. New York: McGraw-Hill, 1965.

10. Hough, John B. and Amidon, E.J. Behavioral Change in Preservice Teacher Preparation: An Experimental Study. Philadelphia: Temple University, College of Education, 1963.

11. Hough, John B. and Duncan, James K. "Exploratory Studies of a Teaching Situatic Reaction Test," Paper read at the annual meeting of The American Educational Research Association, Chicago, Illinois, February, 1965.

12. Hough, John B. 'An Observational System for The Analysis of Classroom Instruction," College of Education, The Ohio State University, 1965 (mimeograph available from the author.

13. Hough, John B. and Amidon, Edmund J. "The Relationship of Personality Structure and Training in Interaction Analysis to Attitude Change During Student Teaching. Paper read at the annual meeting of The American Educational Research Associatio Chicago, Illinois, February, 1965.

A P P E N D I X A

This section of this paper contains summary matrixes for students in each of the five treatments used in this study. In these matrixes all column and row totals as well as individual cells of the matrix have been reduced to percentages rounded to the nearest hundredth place.

SUMMARY OF VERBAL BEHAVIOR USED DURING SIMULATED TEACHING BY SUBJECTS IN TREATMENT ONE (ALL CELLS AND COLUMN TOTALS REDUCED TO PERCENTAGES)

	1	2	3	4	5	6	7	8	9	10	11	12	13	T
1	.01	.00	.01	.01	.03	.01	.00	.00	.00	.00	.00	01	.00	.09
2	.02	.10	1.20	.89	.85	.03	.18	.00	.01	.19	.23	.07	.18	3.95
3	.01	.75	1.57	1.80	2.22	.06	.11	.01	.03	1.21	.88	.20	.30	9.16
4	.00	.04	.04	3.38	.57	.01	.10	.00	00	5.31	1.36	.34	1.56	12.70
5	.02	.14	.18	3.69	23.91	.04	.51	.02	.01	.65	.53	.64	.96	31.30
6	.01	.04	.06	.41	.57	4.81	.05	.01	.00	.07	.30	.60	.11	7.04
7	.00	.01	.01	.19	.19	.00	.45	.01	.00	.88	.45	.04	.24	2.07
8	.00	.00	.01	.02	.02	.00	.00	.02	.00	.00	.01	.00	.01	.08
9	.00	.01	.02	.05	.16	.01	.02	.00	.00	.11	.03	.01	.00	.40
10	.01	2.03	3.87	1.00	.81	.04	.43	.01	.27	3.68	.21	.09	.48	12.95
11	.01	.69	1.86	.31	.46	.08	.04	.01	.06	.03	5.89	.23	.37	10.04
12	.01	.05	.22	.05	.06	1.92	.01	.00	.00	.01	.04	1.14	.05	3.55
13	.01	.08	.11	.91	1.47	.03	.16	.01	.01	.80	.52	.18	2.40	6.66
T	.09	3.95	9.16	12.70	31.31	7.04	2.07	.08	.40	12.95	10.04	3.55	6.66	100.00

$\frac{I}{D}$ Ratio=.973 Revised $\frac{I}{D}$ Ratio= 5.158 Student Teacher Ratio =.397

SUMMARY OF VERBAL BEHAVIOR USED DURING SIMULATED TEACHING BY SUBJECTS IN TREATMENT TWO (ALL CELLS AND COLUMN TOTALS REDUCED TO PERCENTAGES)

	1	2	3	4	5	6	7	8	9	10	11	12	13	T
1	.06	.00	.00	.01	.01	.00	.00	.00	.00	.00	.00	.00	.00	.09
2	.00	.04	1.04	.55	.65	.03	.15	.00	.00	.14	.16	.07	.09	2.93
3	.00	.66	2.61	1.51	2.25	.02	.19	.02	.03	1.53	.91	.19	.30	10.22
4	.00	.04	.04	3.67	.56	.01	.07	.01	.01	5.09	1.14	.26	1.18	12.07
5	.01	.05	.18	3.33	23.50	.01	.72	.02	.01	.35	.60	.56	.84	30.16
6	.00	.03	.05	.36	.44	3.67	.06	.01	.00	.06	.27	.62	.12	5.70
7	.00	.01	.01	.17	.22	.00	.71	.00	.00	1.72	.04	.05	.32	3.27
8	.00	.00	.01	.01	.03	.01	.00	.02	.00	.01	.02	.01	.01	.12
9	.00	.01	.05	.09	.15	.02	.02	.00	.05	.07	.06	.02	.02	.54
10	.00	1.54	4.14	1.26	.56	.01	1.09	.01	.33	4.82	.07	.10	.39	14.33
11	.00	.48	1.88	.26	.47	.04	.02	.01	.07	.02	6.05	.24	.46	10.01
12	.00	.06	.09	.08	.06	1.86	.02	.01	.04	.01	.04	1.17	.05	3.49
13	.01	.02	.11	.77	1.27	.01	.24	.01	.00	.52	.64	.20	3.28	7.08
T	.09	2.93	10.23	12.07	30.16	5.70	3.27	.12	.54	14.34	10.01	3.49	7.07	100.00

$\frac{I}{D}$ Ratio = .910 Revised $\frac{I}{D}$ Ratio = 3.368 Student Teacher Ratio = .428

SUMMARY OF VERBAL BEHAVIOR USED DURING SIMULATED TEACHING BY SUBJECTS IN TREATMENT THREE (ALL CELLS AND COLUMN TOTALS REDUCED TO PERCENTAGES)

	1	2	3	4	5	6	7	8	9	10	11	12	13	T
1	.00	.00	.00	.01	.01	.00	.01	.00	.00	.01	.01	.00	.00	.05
2	.00	.04	.60	.48	.51	.03	.18	.01	.00	.15	.10	.05	.19	2.33
3	.01	.48	2.16	1.29	1.69	.03	.20	.02	.02	1.16	.60	.25	.41	8.31
4	.01	.05	.04	2.87	.53	.01	.14	.02	.00	4.45	.57	.37	1.19	10.25
5	.01	.07	.15	2.70	26.82	.03	.65	.06	.02	.66	.55	.78	1.20	33.71
6	.00	.01	.04	.42	.64	5.48	.10	.00	.00	.13	.44	.71	.26	8.22
7	.00	.03	.01	.14	.37	.00	.90	.01	.00	.83	.04	.07	.49	2.89
8	.00	.00	.01	.05	.07	.01	.02	.04	.00	.03	.01	.01	.02	.27
9	.00	.01	.02	.08	.16	.00	.02	.01	.07	.10	.04	.03	.00	.53
10	.01	1.32	3.81	.91	.95	.02	.31	.05	.28	4.99	.11	.11	.43	13.27
11	.00	.24	1.30	.22	.44	.08	.02	.02	.10	.01	3.80	.22	.29	6.74
12	.00	.03	.08	.06	.06	2.52	.01	.01	.03	.01	.03	1.62	.05	4.51
13	.00	.06	.10	1.03	1.46	.03	.34	.03	.01	.75	.45	.28	4.36	8.89
T	.05	2.33	8.31	10.25	33.72	8.22	2.89	.27	.53	13.28	6.74	4.51	8.89	100.00

$\frac{I}{D}$ Ratio = .780 Revised $\frac{I}{D}$ Ratio = 2.895 Student-Teacher Ratio = .368

SUMMARY OF VERBAL BEHAVIOR USED DURING SIMULATED TEACHING BY SUBJECTS IN TREATMENT FOUR (ALL CELLS AND COLUMN TOTALS REDUCED TO PERCENTAGES)

	1	2	3	4	5	6	7	8	9	10	11	12	13	T
1	.01	.00	.01	.01	.01	.00	.00	.00	.00	.00	.00	.01	.00	.0
2	.00	.07	1.06	.63	.57	.04	.15	.02	.01	.11	.22	.05	.19	3.1
3	.01	.83	2.81	1.43	1.67	.03	.04	.01	.01	.74	1.34	.20	.48	9.7
4	.00	.03	.05	4.36	.90	.01	.10	.02	.01	3.92	1.17	.42	1.38	12.3
5	.01	.06	.10	3.25	24.18	.02	.36	.03	.02	.29	.53	.59	1.17	30.6
6	.01	.03	.02	.49	.47	5.57	.03	.00	.00	.07	.41	.64	.17	7.91
7	.00	.01	.01	.13	.14	.00	.62	.00	.00	.64	.06	.05	.22	1.8
8	.00	.00	.01	.02	.05	.01	.02	.08	.00	.02	.01	.01	.01	.2
9	.00	.01	.04	.06	.13	.01	.02	.00	.13	.07	.09	.03	.02	.6
10	.01	1.32	3.09	.63	.43	.01	.25	.03	.25	3.35	.12	.09	.36	9.9
11	.00	.68	2.30	.33	.48	.09	.05	.02	.11	.02	6.92	.17	.48	11.6
12	.00	.04	.08	.05	.06	2.07	.00	.01	.06	.00	.03	1.91	.05	4.3
13	.00	.05	.13	.98	1.52	.05	.12	.01	.01	.69	.77	.18	3.08	7.6
T	.05	3.13	9.70	12.37	30.60	7.91	1.87	.23	.61	9.94	11.65	4.35	7.61	100.0

$\frac{I}{D}$ Ratio = .996 Revised $\frac{I}{D}$ Ratio = 4.765 Student-Teacher Ratio = .395

SUMMARY OF VERBAL BEHAVIOR USED DURING SIMULATED TEACHING BY SUBJECTS IN TREATMENT FIVE (ALL CELLS AND COLUMN TOTALS REDUCED TO PERCENTAGES)

	1	2	3	4	5	6	7	8	9	10	11	12	13	T
1	.02	.00	.01	.01	.02	.00	.01	.00	.00	.01	.01	.00	.00	.00
2	.01	.06	1.33	.62	.58	.03	.12	.01	.00	.12	.13	06	.20	3 26
3	.01	.85	4.34	1.22	1.85	.04	.13	.01	.01	.86	1 01	.25	.58	11 36
4	.01	.05	.07	3.01	.52	.01	.09	.01	.00	3 74	87	.23	1.64	10.25
5	.02	.05	.15	3.10	27.31	.00	.48	.03	.01	.11	50	.53	1.07	33.37
6	.00	.02	.03	.37	.47	4.82	.02	01	.00	.04	.33	.53	.10	6.74
7	.01	.02	.00	.13	21	00	36	.00	00	.85	.04	.02	.19	1.82
8	.00	01	.01	.01	.04	.00	.01	.04	.00	.01	02	.00	.01	.10
9	.00	.00	.02	.09	.10	.01	.03	.01	.10	.03	.04	.03	.01	.47
10	.00	1.59	3.03	.52	.27	.00	.42	.01	.22	2.94	.07	.05	.26	9.37
11	.00	.52	1.85	.18	.45	.04	.02	.01	.08	.00	8.62	.19	.47	12.41
12	.00	.04	.10	.02	.03	1.76	.00	.01	.04	.00	.03	1.54	.03	3.61
13	.01	.08	.22	.97	1.53	.03	.13	.01	.00	.65	.75	.18	2.54	7.00
T	.09	3.26	11.36	10.25	33.36	6.74	1.82	.16	.47	9.37	12.42	3.61	7.09	100.00

Ratio = .885 Revised Ratio = 6.000 Student-Teacher Ratio = .376

The last paragraph on page 20 should read:

Table VI shows the results of a series of *t* tests comparing the categories of verbal behavior used by subjects in treatment groups taught human relations skills by means of the Relationship Improvement Program and those combined groups in which the program was not used. Only in the use of category three (acceptance and clarification of student ideas) did these two combined groups of subjects differ.